

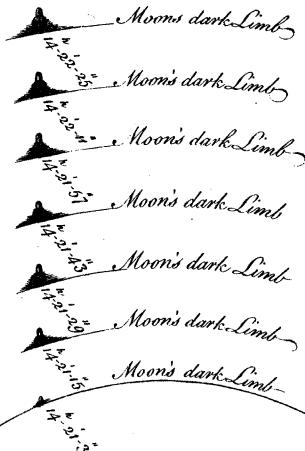
XCIV. *Certain Reasons for a Lunar Atmosphere*; by Mr. Samuel Dunn.

Read July 1, 1762. IT has been a question which has been long debated among astronomers, whether the Moon has an atmosphere or not? and, as far as I have been able to learn from reading and verbal inquiry, the question is yet undecided. The best astronomers I have talked with about this matter, have told me they never could discover any atmosphere about the Moon. But this being unsatisfactory to me, I began to consider with myself, by what methods, not already used, this problem was likely to be solved; and, among several others, thought of one, which I don't know that it has been used before; namely, by a nice examination of the two ends of Saturn's ring, at such time when the planet is on the dark edge of the Moon. For the ring of Saturn being of a considerable length, and gradually emerging or immerging almost at right angles, either from or to the dark disk of the Moon, the two extremities of this ring, and the body of Saturn, being duly observed, if both the preceding and subsequent extremities of the ring, and the body of Saturn also, should happen to appear not perfectly defined, exceedingly near to the Moon's dark limb, but perfectly defined a little further therefrom; from such an appearance, I conclude it might be strongly presumed, that there is a lunar atmosphere; and for want of such appearance, that there is none.

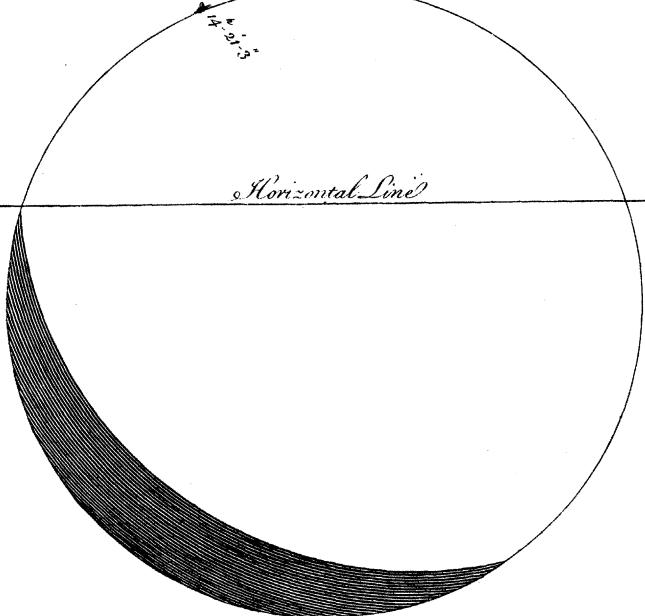
Such

The Appearance of SATURN, as Emerging from behind the Dark Limb of the MOON, 16. June 1762. At 14. H. 22 M. app. Time at Chelsea.

Saturn clear of the Moon's Limb
and perfectly defined



Horizontal Line



Such an observation I made 16th instant, or rather 17th, past two in the morning; the particulars of which follow. [Vide Tab. XVIII.]

The 16th, at noon, I sat a pendulum-clock, by which this observation was made, to solar time, by the Sun's transit over the meridian, and determined with myself to use a Gregorian reflecting telescope, magnifying 55 times, as the same would be easily manageable (and no risque would be run of missing the point of either immersion or emersion, but especially the latter, as it might not be so easily found on the Moon's dark limb by a telescope of a smaller field of view). I waited to make this observation, but could not see the Moon till $14^h 22'$, when she emerged from dark still clouds into a most clear and serene sky, nothing could be finer for observation; and thus she continued during the observation, and long after it.

The focus of the telescope stood as it had stood for several days, and as I had seen Venus near the horizon with it two evenings before, and Jupiter with his satellites not high above the horizon the preceding morning; and now I had compared it with the fixed stars, and the Moon, after emergency from the aforementioned clouds. So the telescope was rightly adjusted.

At $14^h 21' 3''$, I saw a faint point of light, where the emersion afterwards appeared; but this faint point of light appearing and disappearing by alternate fits, I could not know if it was part of Saturn or of one of his satellites, till it was $14^h 21' 13''$, when this point of light was grown a little brighter and larger, and therefore I judged it was the tip of the ring just emerging. Yet it appeared so dull and hazy, that I
had

had suspected my telescope, if I had not known it to have been rightly adjusted.

At $14^h 22' 4''$, the preceding part of the ring was emerged, and it appeared more bright; and now the body seemed emerging or emerged, but so very hazy and ill defined, both the body and the ring confused together, closely on the Moon's dark limb, that I should not have taken it for Saturn, but for a comet emerging from behind the Moon, had I not known otherwise from the tables, or seen Saturn the preceding mornings.

At $14^h 22' 30''$, the preceding end of the ring more plain and bright, the subsequent end of the ring more dull; and the body, at this time, appeared a little more distinct than before. I continued observing to see what would follow.

At $14^h 22' 34''$, the subsequent end of the ring appeared most dull, and the preceding end clear; after which, in some short space of time, the whole ring and body of Saturn appeared sharply and well defined.

Wherefore, I conclude, that this diversity of appearance must have arisen from the effects of an atmosphere of the Moon.

Chelsea,
19th June, 1762.

Samuel Dunn.

N. B. The latitude of my place is $51^{\circ} 29' 5''$ N.
and 41 seconds of time west of the Royal Observatory at Greenwich.